

# **ISSUES FACED BY SOFTWARE PROJECT MANAGERS IN PAKISTAN DURING THE EXECUTION OF MULTI-LOCATED AND MULTI- CULTURAL PROJECTS, A CASE STUDY**

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## ***Abstract.***

With the increase of software development business in Pakistan, Software Project Managers are facing a multitude of issues while running multi-location as well as multi-cultural projects. This paper analyzes execution of such projects in Pakistan to uncover the major problems such as communications, time zone differences, geographical distance and cultural disparities. Further an attempt is made to resolve such challenges and suggest their successful navigation to software project managers in the organizations operating in Pakistan.

**Keywords:** Multi-located, Multi-culture, SPM, SCM

## **1. Introduction**

Generally software and telecom companies are offshore development centers, some of which are multinational. Such centers contribute to economic infrastructure in the country, leading to opportunities for collaboration between the investors and professionals. Economic infrastructure of an organization provides framework necessary to increase the productivity and quality products. Multi-located and multi-cultural team structure allows client's access to talent and skills that would not otherwise have. Indeed it helps in breaking down the geographical boundaries. There are several problems faced by software project managers (SPM) while managing multi-located and cross-culture projects and teams. These problems arise due to communication barriers, national and corporate culture, different time zone and language. All these issues directly affect the software development life cycle and need to be addressed to create the proper understanding to manage the project effectively. This paper focuses on issues and challenges faced by SPM in managing such projects. Idea is suggest solutions to avoid or at least to minimize affect of these issues. In order to improve the SPM's ability to achieve the goals, in enhancing the product quality in the software industry. The paper is organized is a manner that, next section discuss the impact of a multi-location software development / activity are the subsequent section discusses issues and the impact of multi-cultural aspects. Section 4 describes the survey results that the author conducted in order to assess the main obstacles generally faced by the software development organization in a multi-location and – culture environments. Section 5 takes up the suggestions and solutions to the issues such as communication, time zone differences, geographical and cultural differences etc. Finally, the section 6 provides the conclusions.

## **2. Multi-Location Impact**

It is easy to manage a software development team when all of its members are stationed at the same location. On the other hand, it becomes exponentially more challenging to manage multi-located teams. In succeeding paragraphs some of the issues generally faced by SPM and their teams are discussed.

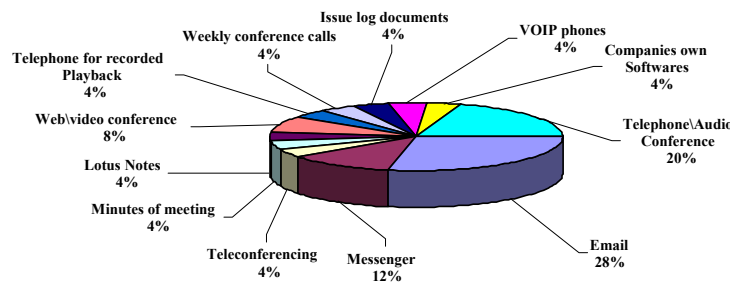
### **A. Communication Gap**

Lack of communication and coordination are the principal challenges in software development organizations. How can we ensure that everyone shares the same understanding? How can we compensate each other in the absence of body language? (D'Larenti et al., 2003), (Stephen Weatherley, GDS). Non-verbal signals such as body language and eye contact are very important for effective communication. Lack of such signals can easily result in a misunderstanding (Dennis G. Ballow and Sr. MAED, 2004-2005). Furthermore, it is not easy to manage teams without face-to-face contacts, professional relationship and mutual trust. Presently, the most common and effective tool of communication is e-mail as depicted in Fig. 1 (Maria Anjum et al, 2006). Sometimes, response via e-mail can be delayed due to network or

Internet connectivity problem. There is another reason of delay in response that team member's do not check their e-mail regularly. Information is not passed on properly to all stakeholders when the size of the project team is large and located in different places. These causes delay the project schedule (D'Larenti et al., 2003), (Chad Lewis, 2006), (George Pitagorsky, 2006)

## B. Software Configuration Management

The use of software configuration management (SCM) system increased with the complexity of the products and projects. Some software development organizations are using obsolete tools which cause the maintenance problem in integrated development environment. Most software projects have been developed by teams situated at multi-locations and working in parallel development environments on the same data document or code. In this situation any component of the data remains checked out which others may not be able to process those changes unless it has been checked in. Sometimes the available data "code" un-functional due to improper control on SCM system. There are a number of obstacles in successful implementation of SCM includes lack of training on tool utilization, resistance and ignorance in using SCM system and fear of additional work. All these issues increase the administrative burden of the lead. It is difficult to maintain and coordinate with team members on irrelevant project documents that also increases the time and cost (Maria Anjum et al, 2006), (Alex Leo, 2004).



**Figure 1: Communication method**

## C. Resource Sharing

The knowledge of team members usually varies when resources are shared among them in different locations. The resource sharing is a common problem in software development environment in which two or more team members share their data in a common resource pool (Alex Leo, 2004). Sometimes it happens that few team members have certain ideas but they are not able to exchange those ideas with other team members due to inappropriate level of understanding on centralize resource pool while working on multi-located environment. Such issues hinder the valuable

information from SPM and put significant impact on the project. (Maria Anjum et al, 2006), (Alex Leo, 2004)

#### **D. Data Sharing and Connectivity**

Another problem for SPM is data sharing and connectivity in the organization while transferring data from one location to other, for example, transfer of large databases from customer sites to track product issues. This data transfer requires high data bandwidth specifically in Pakistan where satellite bandwidths links are limited due to high services charges. There is only a single fiber-optic link available in Pakistan through sea which provides bandwidth to IT industry and call centers. Pakistan's sole fiber-optic (SEA-ME-WE3) cable connection to the internet was damaged in year 2005. This worst internet disaster in Pakistan was caused by a lack of contingency support and the absence of redundant connectivity. There was big upset to different services virtually connected to "e" such as e-mails, e-ticketing, e-commerce, e-bookings e-correspondence e-records, e-newspapers etc. These bandwidth links are not sufficient to meet above challenges of software industry in Pakistan.

#### **E. Data Security**

Data security is another issue while sending through vulnerable data connectivity channels. Confidential data must be secured before sending through the Internet. Small size companies in Pakistan are not able to afford high priced security software and hardware systems to ensure the secure data transfer.

#### **F. Cost**

Usually software development organizations have multi-located offices to increase their market share and revenues. Due to resource duplication, project cost on similar project can increase. An inherent problem with working in different locations is the cost and traveling time. There are more hidden costs associated with multi-located projects such as shipping and logistics costs, customs and import duties and agents fees etc. (Dennis G. Ballow and Sr., MAED, 2004-2005). There were potential losses in terms of cost paid by Internet subscribers when Pakistan's sole fiber-optic connection to the internet was severed. Pakistan Telecom bears all losses by compensating IT and Telecom companies in the country. Pakistani businesses particularly software industry and Telecom sector have to deal with the fallout

### **3. Multi-Cultural Impact**

#### **A. Cultural Sensitivity**

Cultural differences are usually significant in projects being handled on various locations around the globe. These differences can be different nations' characteristics, differences in ethnic, national and corporate cultures. The difference in political and economic stability varies culture to culture. Decision-making can difficult when such differences exist. Multi-cultural impact is not a singular concept; it's a combination of different factors which affect the general interaction and collaboration in any multi-culture organization, both in positive and negative ways (Ghaffar, F. et al., 2005). The problem occurs when the interaction and teamwork is required and conducted across

diverse cultures. The cultural issues can be broken down into a few major factors such as language, communication, nation and corporate culture, time and relationship (Chad Lewis 2006), (Dennis G. Ballow, Sr., MAED, 2004-2005). There are number of cultural communication differences in Pakistan which sometimes result in organization's misunderstanding and misinterpreting. These communication differences can badly affect the flow of communication in the organization. The difference in learning style preference is one such difference.

### **B. Language Issue**

A key issue affecting multi-cultural project team is the language. In many situations, non-native speakers are working in their second or third languages, with the consequential loss of effectiveness, which also increases the risk of mistakes or misunderstanding. In these situations, interpreters and translators are required; this has the effect of considerably slowing down the whole communication process. Language especially becomes an issue when the other countries do not use English as their medium of communication. Understanding each other's views is vital for project success. Language plays a fundamental role where team members of different nationalities speak the same language like dealing with Chinese, Japanese and German people (Stephen Weatherley, GDS). It is difficult to understand their point of view because they prefer to speak in native language. In Pakistan, people are used to speak English as an official language. Sometimes it does happen that people do not understand the others native language issues. Problem does occur due to unawareness of native language understanding. These issues impact on smooth communication process, delays are predictable in the project schedules. (Dennis G. Ballow, Sr., MAED, 2004-2005)

### **C. Time Zone differences**

Working in different time zone is another challenge for SPM while managing projects with other groups located outside the country. The major problem is the turnaround time required for the queries. SPM have to wait for an entire day to get a reply from an office that is located in another time zone. SPM may try to reduce this turnaround time by working in the late hours. These late-hours sittings, however, can cause problem in a country like Pakistan where evenings are required to be dedicated to family matters due to joint family system (George Pitagorsky, 2006), (Ghaffar, F. et al., 2005).

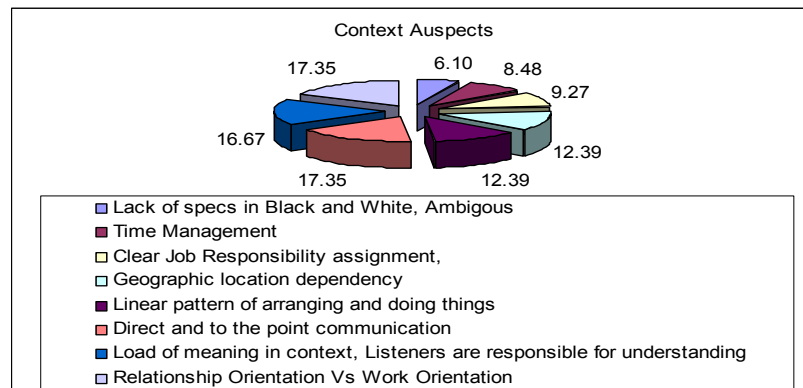
### **D. National Culture**

Most countries have a cultural history, norms and values. They set their own ways of getting things done that can help. In some cases, people belong to cultures where decisions are made by consensus; and possibly others make the decisions in a more autocratic ways. One of the culture factors is a religious observance. This religious practice varies around the world and can be very significant in getting a project completed. Setting aside time for religious observance during the working hours might be necessary, including places for prayer. Many countries have religious festivals, fasts and feast days that are non-working days (Stephen Weatherley, GDS). Sometimes the project is in a critical stage when official holidays are observed in one region which can not be schedule before time because it depends on the appearance of

moon. Conflicts might occur if SPM cannot comprehend with the nature or cultural significance of the holidays (Chad Lewis 2006), (Ghaffar, F. et al., 2005)

## E. Organizational Cultures

Project teams are usually drawn from several different companies, each with its own organizational culture. (Stephen Weatherley, GDS). To work together well, there needs to be some degree of commonality in organizational cultures. In culture like Pakistan, the status and hierarchy dominants and can lead to a lack of empowerment of junior staff. Different views of age and experience, valued in some cultures, or attitudes to women can lead to difficulties particular in Pakistan (Dennis G. Ballow, Sr., MAED, 2004-2005). In organization culture, people tend to communicate less where as in others. On the other hand, people tend to communicate with colleagues and group intensively and exchange information with each other on various issues. As a result everyone in the team is constantly updated similar picture of the organization's business. Multi-cultural organizations may have different policies based on their cultures. For instance, there can be difference in office timings, leadership and management style, salary packages and other incentives. Office timings and salary packages are usually not comparable but sometimes issues arise when one office of the organization is given certain benefits like health insurance and others are not which can create de-motivation in employees. The following figure shows that how culture sensitivity affect overall organization performance in different aspects. (Ghaffar, F. et al., 2005)



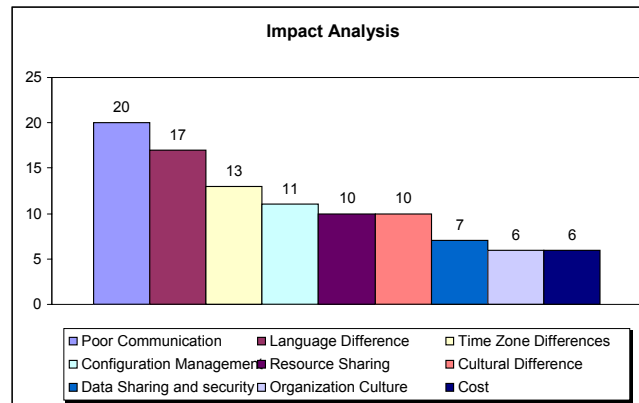
**Figure 2: Culture sensitivity impact on organizations**

As shown in Fig 2. There are number of issues that impact on software development organizations due to culture sensitivity includes, “*lack of specs in Black and White, ambiguous, time management and geographic location dependency*” (Ghaffar, F. et al., 2005).

## 4. Survey Results

A survey was conducted by author to assess the major obstacles faced by software development organizations working in multi-located and environment. Survey results are shown in Fig 3. About 20% issues arise due to poor communication between multi-location and cultural operated projects and about 17% of the resources are not familiar with multi-culture issues and its work environment. Due to geographical time differences and lack of proper configuration management also does affect overall

organization performance. Survey also indicates that about 10% of the organizations affect due to culture differences. There are more areas that affect overall organizations but there impact is very low as compared to previously discussed areas.



**Figure 3: The survey results conducted in software development organizations in Pakistan**

Author conducted few formal and informal interviews as part of survey with different people working in software development organizations in Pakistan to just assess their motivation and behavioral level. It is concluded that explanations are taken as insult. Mostly People tend to hide information even within an organization or department no matter at what level they are in organizational hierarchy. However, those people working in the strong culture need to know what is going on and requires detailed background information where explanations are taken as healthy exercise to boost confidence and motivate them, so, the flow of information could be possible across the organization.

## 5. Suggestions and Solutions

An organizations in Pakistan can not improve process and product quality in a single day as improvement is a continuous process. An understanding of best fit practices as well as taking the corrective actions against those critical issues that are identified in this paper can increase overall organization's performance. The SPM must start by understanding what practices should be adopted and make sure that the practices should not harm peoples motivation. SPM must consider its strategic direction by focusing on the "gap" between where a company is and where it has to be. Priorities must be set for making improvements.

### A) Manage communication

SPMs may make it a requirement to get regular updates through web, phone calls, videoconferencing, and e-mails in order to reduce communication gap. They may further establish disciplines and guidelines for electronic communication. Unless team members know how to use the available tools and are willing to shift their normal styles, there will be disruption in smooth working. There can be proper training as well as a set of guidelines which should cover the effective use of e-mail as well as the efficient use of a web based collaboration tools such as Microsoft SharePoint

Server (George Pitagorsky, 2006), (David, F.R., 2007). Effective use of tools requires standards and procedures such as subject title in the e-mail or requirement specification to address specific issue which should be brief and precise. To recognize, it is appropriate to put something in an attachment as opposed to the body of an e-mail; to make more efficient use of e-mail as a tool. Proper use of SharePoint server and hands on experience is necessary for SPM to handle product documentations, project and code etc.

### **B) Time Zone Differences**

The time zone differences can be reduced by introducing next shifts which help those organizations that are communicating with the countries where time differences are 8-10 hours, like Pakistan is more than 8 hours ahead of US GMT. SPMs should make sure that the team members are flexible in terms of time management. They must be service oriented, not only to the clients and sponsors but also to one another. SPMs may be considerate enough to hold meetings in hours that are suitable to all team members who might reside in different time zones. Furthermore, the team members should also be flexible enough to adjust these timings in order to meet the customer's satisfaction round the clock. SPMs may manage time zone issues recognizing the need of people where they are bound in social and personal life and not able to work in odd hours (Stephen Weatherley, 2007). The planning and policies can resolve such problems at beginning of the project.

### **C) Use of advanced tools and Techniques**

The use of advanced tools and techniques is initial part of software development organizations to survive in highly competitive business environment. There is need of a proper configuration management system. A team may be responsible for authorizing the code at the end of day. If a project does not setup a common SCM system at project initiation, especially when teams are physically located at customer sites present SCM issues. An extensive focus to common repository system for each project should be given before implementing any processes around SCM. SCM can be implemented when such change in items of the project is done in time and the latest copy is available to all the team members and on demand basic should delivered to the customer. (Michael K. 1995). (Kath Schwalbe, 2006)

### **D) Security checks on sensitive data**

There should be security checks on sensitive data to prevent from hackers and use standard mechanism like European & American laws present restriction to take sensitive/individual's personal data outside EU/US. ISO security standard can help in this regard. Issues related to data sharing and connectivity, there is need of a central repository for all project related to documentations. It should be accessible for all stakeholders with control access rights so that everyone knows the project progress and remains updated accordingly.

### **E) Language specific training**

A project must have a common language to ensure a common understanding. It can be suggested that if the other person is not fluent in standard language, he should be good



in writing, thus his point can be conveyed across the board. To reduce language issues, language specific trainings can be arranged. If there is specific requirement of some language on the project, a language expert can be hired for specific project. SPM as a mediator should have know-how of all the required languages or they hire at least one person who can speak, write in native language as per project requirements.

#### **F) Cultural understanding**

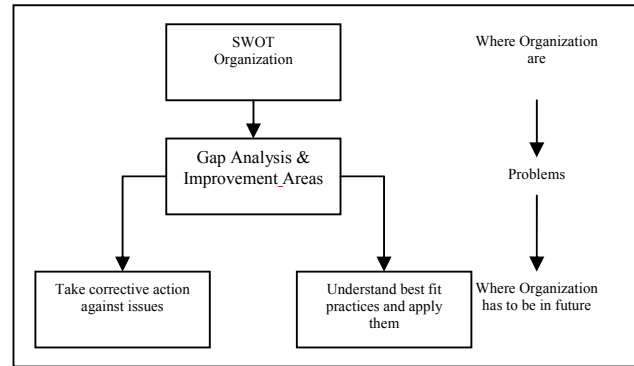
Today there is more awareness in Pakistan of multi-cultural organization issues and their effect on the process and product quality and economic development in the country. SPM must avoid such conflicts by familiarizing all team members with the different cultural norms with in the country and outside the company. It is important to establish and understand the organizational background and culture of all the parties involved in the project from the outset. Changing cultural behavior can be done but needs active dedication and involvement of all to make it work. Most of the times it is a foreigner coming into a software development projects in a management position over Pakistani employees. This is a short sighted approach that today through increased education and awareness is changing (Ghaffar, F. et al., 2005). One strong viewpoint for software organizations in Pakistan is that it is the foreigners not the Pakistani individual that needs to be more culturally aware.

#### **G) Manage customer issues**

With every passing day software development organizations growing and so is its clientage. This has a direct impact on the workload. In this context SPM must plan to expand customer support team and maintenance team in order to meet customer satisfaction. SPM must have standby arrangements/ person(s) for any emergent requirements from the stakeholders during the holidays in Pakistan

#### **H) Stable infrastructure**

Pakistan is an open economic development zone, which facilitate investors to expand their global business in the country. More active involvement requires from government of Pakistan to create technology hub for foreign investor. By providing cheapest tariff in IT business, we can provide incentives to foreign investors to setup their business in the country. Pakistani official should explore the cheaper bandwidth backups to meat the emergencies. It is also necessary to provide stable and fast Internet connectivity links to IT services and exercises to reduce potential losses in the future. Today's global customers consider many attributes other than cost when making purchasing decisions. This has required organizations in Pakistan to spend more time observing and understanding their business partners and customers needs. By conducting gap analysis shows in Fig 4. SPM can identify issues and take corrective action. (Michael K., 1995), (Kenneth Crow, 1999).



**Figure 4: Gap analysis**

## 6. Conclusions

It is to conclude that SPMs are being affected by various multi-location and multi-cultural factors. It is a challenge for software development organizations in Pakistan to meet the different complex needs of the project that affect the process and product quality in order to survive in global competitive environment. This paper highlighted the problems and suggested some solutions to the problems generally faced by SPMs in Pakistan in the execution of multi-location and -cultural projects. Software project managers having necessary skills and knowledge can improve the performance of the organization as well their team members. There is need to learn how to analyze the opportunities and threats, found in the organization with the internal and external strengths and weaknesses. They can formulate strategies and develop ways to implement them. It is important for software development organizations in Pakistan to have some understanding of the behaviors and learning styles that varies culturally as well as potentially and impact the services, products and delivery process.

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